IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

ULTRAVISION TECHNOLOGIES, LLC, *Plaintiff*, v. HOLOPHANE EUROPE LIMITED, ACUITY BRANDS LIGHTING DE MEXICO S DE RL DE CV, HOLOPHANE, S.A. DE C.V. and ARIZONA (TIANJIN) ELECTRONICS PRODUCTS TRADE CO. LTD.,	§	Case No. 2:19-cv-00291-JRG-RSP LEAD CASE
YAHAM OPTOELECTRONICS CO. LTD.,	§	Case No. 2:19-cv-00398-JRG-RSP MEMBER CASE
SAMSUNG ELECTRONICS CO., LTD., *Defendants*.	§	Case No. 2:20-cv-00053-JRG-RSP MEMBER CASE

CLAIM CONSTRUCTION MEMORANDUM AND ORDER

On September 9, 2020, the Court held a hearing to determine the proper construction of the disputed claim terms within United States Patent Nos. 8,870,410 ("the '410 Patent"); 8,870,413 ("the '413 Patent"); 9,734,738 ("the '738 Patent"); 9,947,248 ("the '248 Patent"); and 10,223,946 ("the '946 Patent") (collectively, "the Asserted Patents"). Having reviewed the arguments made by the parties at the hearing and in their claim construction briefing, Dkt. Nos. 96, 98 & 99, having considered the intrinsic evidence, and having made subsidiary factual findings about the extrinsic evidence, the Court hereby issues this Claim Construction Memorandum and Order. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *see also Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331–32 (2015).

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I. BACKGROUND

Plaintiff Ultravision Technologies, LLC ("Plaintiff" or "Ultravision") alleges that Defendants Holophane Europe Limited, Acuity Brands Lighting De Mexico S De RL De CV, Holophane S.A. De C.V., and Arizona (Tianjin) Electronics Products Trade Company, Ltd. ("Holophane"), Yaham Optoelectroincs Co., Ltd. ("Yaham"), and Samsung Electronics Co., Ltd. ("Samsung") (collectively, "Defendants") infringe the Asserted Patents. Shortly before the start of the September 9, 2020 hearing, the Court provided the parties with preliminary constructions with the aim of focusing the parties' arguments and facilitating discussion.

All of the Asserted Patents are based on the same specification. Plaintiff contends that the Asserted Patents describe an LED lighting apparatus with several advantages. Dkt. No. 96 at 7.[1] Plaintiff states that one advantage is the light from each LED is projected onto the entire surface of the desired target area. *Id*. at 8 (citing '410 Patent at 5:4–9). According to Plaintiff, when a single LED fails, the overall illumination decreases ever so slightly, but the uniformity of that illumination remains unchanged. *Id*. (citing '410 Patent at 5:19–21). Plaintiff further states that the optical elements are also designed so that the target area is evenly illuminated, and that the area outside the target area "would receive no illumination at all or at least a minimal amount of illumination from the LED 416." *Id.* (quoting '410 Patent at 5:9–14).

The Abstract of the '410 Patent states the following:

> An optics panel for use in a light emitting diode (LED) lighting is disclosed. A plurality of LEDs is disposed on a substrate and directed outward therefrom. A substantially transparent substrate is disposed over the plurality of LEDs and configured to direct light from each of the plurality of LEDs of the lighting assembly onto a surface having a predetermined bounded area. Light from each of the LEDs is directed by the transparent substrate across the entire area of the surface so that each LED illuminates substantially the entire surface with a substantially equal level of illumination per LED.

[1] Citations to the parties' filings are to the filing's number in the docket (Dkt. No.) and pin cites are to the page numbers assigned through ECF.

Claim 1 of the ’410 Patent is an illustrative claim and recites the following elements with the disputed terms bolded:

> 1. **An optics panel for use in a light emitting diode (LED) lighting assembly comprising**:
> a plurality of LEDs disposed on a substrate and directed outward therefrom; and
> a **substantially transparent** substrate comprising a plurality of optical elements disposed over the plurality of LEDs and configured to direct light from each of the plurality of LEDs of the lighting assembly onto a **display surface** external to the optics panel, the **display surface** having a **predetermined bounded area**, wherein **each of the plurality of optical elements comprises a first lens element and a second lens element disposed over the first lens element**, wherein the light from each of the LEDs is directed through the first lens element and the second lens element across **the entire area** of the **display surface** so that each LED evenly illuminates **substantially the entire display surface** with a **substantially equal level of illumination** from each of the LEDs.

II. APPLICABLE LAW

A. Claim Construction

This Court’s claim construction analysis is guided by the Federal Circuit’s decision in *Phillips v. AWH Corporation*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the Federal Circuit reiterated that “the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Id*. at 1312 (citations omitted). The starting point in construing such claims is their ordinary and customary meaning, which “is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Id*. at 1312–13 (citations omitted).

However, *Phillips* made clear that “the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id*. at 1313. For this reason, the

specification is often "the single best guide to the meaning of a disputed term." *Id*. at 1315 (citation omitted). However, it is the claims, not the specification, which set forth the limits of the patentee's invention. *Id.* at 1312 (citations omitted). Thus, "it is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004) (citations omitted). Other asserted or unasserted claims can also aid in determining a claim's meaning. *See, e.g.*, *Phillips*, 415 F.3d at 1314 (explaining that use of "steel baffles" and "baffles" implied that "baffles" did not inherently refer to objects made of steel).

The prosecution history also plays an important role in claim interpretation as intrinsic evidence of how the U.S. Patent and Trademark Office ("PTO") and the inventor understood the patent. *Id*. at 1317 (citations omitted); *see also Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) (noting that "a patentee's statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation"); *Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1361 (Fed. Cir. 2017) (applying this principle in the context of *inter partes* review proceedings). However, "because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes." *Phillips*, 415 F.3d at 1317 (citing *Athletic Alts., Inc. v. Prince Mfg.*, 73 F.3d 1573, 1580 (Fed. Cir. 1996) (noting that ambiguous prosecution history may be "unhelpful as an interpretive resource" for claim construction)) (other citation omitted).

Additionally, courts may rely on extrinsic evidence such as "expert and inventor testimony, dictionaries, and learned treatises." *Id*. at 1317 (quoting *Markman v. Westview Instruments, Inc.*,

52 F.3d 967, 980 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370 (1996)). As the Supreme Court explained, "In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva Pharm*, 574 U.S. 318, 331 (2015) (citation omitted). However, the Federal Circuit has emphasized that such extrinsic evidence is subordinate to intrinsic evidence. *Phillips*, 415 F.3d at 1317 ("[W]hile extrinsic evidence can shed useful light on the relevant art, we have explained that it is less significant than the intrinsic record in determining the legally operative meaning of claim language.") (internal quotation marks omitted) (citations omitted).

B. Departing from the Ordinary Meaning of a Claim Term

There are "only two exceptions to [the] general rule" that claim terms are construed according to their plain and ordinary meaning: "1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of the claim term either in the specification or during prosecution."[2] *Golden Bridge Tech., Inc. v. Apple Inc.*, 758 F.3d 1362, 1365 (Fed. Cir. 2014) (quoting *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)); *see also GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) ("[T]he specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal."). "The standards for finding lexicography and disavowal are exacting." *GE Lighting Sols.*, 750 F.3d at 1309.

"To act as its own lexicographer, the patentee must 'clearly set forth a definition of the disputed claim term,' and 'clearly express an intent to define the term.'" *Id*. (quoting *Thorner*, 669

[2] Some cases have characterized other principles of claim construction as "exceptions" to the general rule, such as the statutory requirement that a means-plus-function term is construed to cover the corresponding structure disclosed in the specification. *See, e.g., CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1367 (Fed. Cir. 2002).

F.3d at 1365); *see also Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998) (citations omitted). The patentee's lexicography must appear "with reasonable clarity, deliberateness, and precision." *Renishaw*, 158 F.3d at 1249 (citations omitted).

To disavow or disclaim the full scope of a claim term, the patentee's statements in the specification or prosecution history must amount to a "clear and unmistakable" surrender. *Cordis Corp. v. Bos. Sci. Corp.*, 561 F.3d 1319, 1329 (Fed. Cir. 2009) (citations omitted); *see also Thorner*, 669 F.3d at 1366 ("The patentee may demonstrate intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." (citations omitted)) "Where an applicant's statements are amenable to multiple reasonable interpretations, they cannot be deemed clear and unmistakable." *3M Innovative Props. Co. v. Tredegar Corp.*, 725 F.3d 1315, 1326 (Fed. Cir. 2013) (citations omitted); *see also Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016) ("When the prosecution history is used solely to support a conclusion of patentee disclaimer, the standard for justifying the conclusion is a high one.").

Although a statement of lexicography or disavowal must be exacting and clear, it need not be "explicit." *See Trs. of Columbia Univ. in City of New York v. Symantec Corp.*, 811 F.3d 1359, 1364 (Fed. Cir. 2016) ("[A] patent applicant need not expressly state 'my invention does not include X' to indicate his exclusion of X from the scope of his patent" (quoting *Astrazeneca AB v. Mut. Pharm. Co.*, 384 F.3d 1333, 1340 (Fed. Cir. 2004) (citations omitted)). Lexicography or disavowal can be implied where, *e.g.*, the patentee makes clear statements characterizing the scope and purpose of the invention. *See On Demand Mach. Corp. v. Ingram Indus., Inc.*, 442 F.3d 1331, 1340 (Fed. Cir. 2006) ("[W]hen the scope of the invention is clearly stated in the specification, and is described as the advantage and distinction of the invention, it is not necessary to disavow

explicitly a different scope." (citation omitted)). Nonetheless, the plain meaning governs "[a]bsent implied or explicit lexicography or disavowal . . . ." *Trs. of Columbia Univ.*, 811 F.3d at 1364 n.2.

C. Definiteness Under 35 U.S.C. § 112(b)

Patent claims must particularly point out and distinctly claim the subject matter regarded as the invention. 35 U.S.C. § 112(b). A claim, when viewed in light of the intrinsic evidence, must "inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). If it does not, the claim fails § 112(b) and is therefore invalid as indefinite. *Id*. at 901. Whether a claim is indefinite is determined from the perspective of one of ordinary skill in the art as of the time the application for the patent was filed. *Id*. at 908 (citations omitted). As it is a challenge to the validity of a patent, the failure of any claim in suit to comply with § 112 must be shown by clear and convincing evidence. *Id*. at 912 n.10. "[I]ndefiniteness is a question of law and in effect part of claim construction." *ePlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 517 (Fed. Cir. 2012).

When a term of degree is used in a claim, "the court must determine whether the patent provides some standard for measuring that degree." *Biosig Instruments, Inc. v. Nautilus, Inc.*, 783 F.3d 1374, 1378 (Fed. Cir. 2015) (quotation marks omitted) (citation omitted). Likewise, when a subjective term is used in a claim, "a court must determine whether the patent's specification supplies some standard for measuring the scope of the [term]." *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1351 (Fed. Cir. 2005); *accord Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364, 1370–71 (Fed. Cir. 2014) (citing *Datamize*, 417 F.3d at 1351).

III. THE PARTIES' STIPULATED TERMS

The parties agreed to the constructions of the following terms/phrases in their August 18, 2020 P.R. 4-5(d) Joint Claim Construction Chart.

Claim Term/Phrase	Agreed Construction
"acrylic material" • '410 Patent Claims 15, 21 • '413 Patent Claims 4, 10, 12	"material containing primarily acrylates"
"acrylic material substrate" • '410 Patent Claims 15, 21	"substrate containing primarily acrylates"

Dkt. No. 100-1 at 1. In view of the parties' agreement on the proper construction of the identified terms, the Court hereby **ADOPTS** the parties' agreed constructions.

IV. CONSTRUCTION OF DISPUTED TERMS

The parties dispute the meaning of nineteen terms/phrases in this case. The Court previously conducted a claim construction hearing and preliminarily construed several of the terms disputed here in *Ultravision Techs., LLC v. Lamar Advert. Co., et al.*, Case No. 2:16-cv-374 (the "*Lamar* Case"). The parties reached a settlement in that case shortly after the claim construction hearing and before the Court issued a final claim construction order.

A. "[each of the plurality of optical elements comprises] a first lens element and a second lens element disposed over the first lens element"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"[each of the plurality of optical elements comprises] a first lens element and a second lens element disposed over the first lens element" • '410 Patent Claims 1, 16, 22 • '413 Patent Claims 3, 7, 13	plain and ordinary meaning	"[each of the plurality of optical elements comprises] a lens with two optical surfaces placed or arranged on another lens with two optical surfaces"

1. The Parties' Positions

The parties dispute whether the "first lens element" and the "second lens element" must be "distinct lens structures," which would require the "optical element" to be an assembly of distinct lens elements. Plaintiff contends Defendants' construction is nonsensical and likely indefinite.

Dkt. No. 96 at 16. Plaintiff argues that Defendants' construction appears to require two lenses, each with two optical surfaces that are placed atop one another. *Id*. Plaintiff further argues that the term "optical element" and the corresponding claim language are words that the jury can easily understand without further construction. *Id*. Plaintiff also contends that the specification illustrates several preferred embodiments of optical elements that do not support Defendants' proposal. *Id*. at 15–17) (citing '410 Patent at 5:1–3, 5:29–31, 5:43–46, Figs. 5C, 5D).

Defendants respond that a "lens element" is a distinct lens structure and that an optical element has two such lens structures, *i.e.*, "[each of the plurality of optical elements comprises] a lens with two optical surfaces placed or arranged on another lens with two optical surfaces." Dkt. No. 98 at 8. Defendants argue that Figures 8A-J indicates that "lens element" refers to a single lens with two optical surfaces and an "optical element" refers to multiple lens elements, with one lens element disposed over another. *Id*. (citing '410 Patent at 8:6–13, Figs. 8D–8G). Defendants contend that these figures illustrate that the lens elements are discrete lenses. *Id*. at 9. Defendants further contend that Plaintiff ignores the embodiment illustrated in Figs. 8A–J and focuses on the embodiment of Figures. 5A–D. *Id*. Defendants argue the patent never uses the term "lens element" to describe any component of these figures. *Id*. (citing '410 Patent at 4:64–65). Defendants further argue that the specification describes these as "surfaces," not "lens elements." *Id*. at 10 (citing '410 Patent at 5:43–48, 8:16–14). Finally, Defendants contend that their construction is also consistent with the plain meaning. *Id*. (citing Dkt. No. 98-5 at 2; Dkt. No. 98-6 at 4).

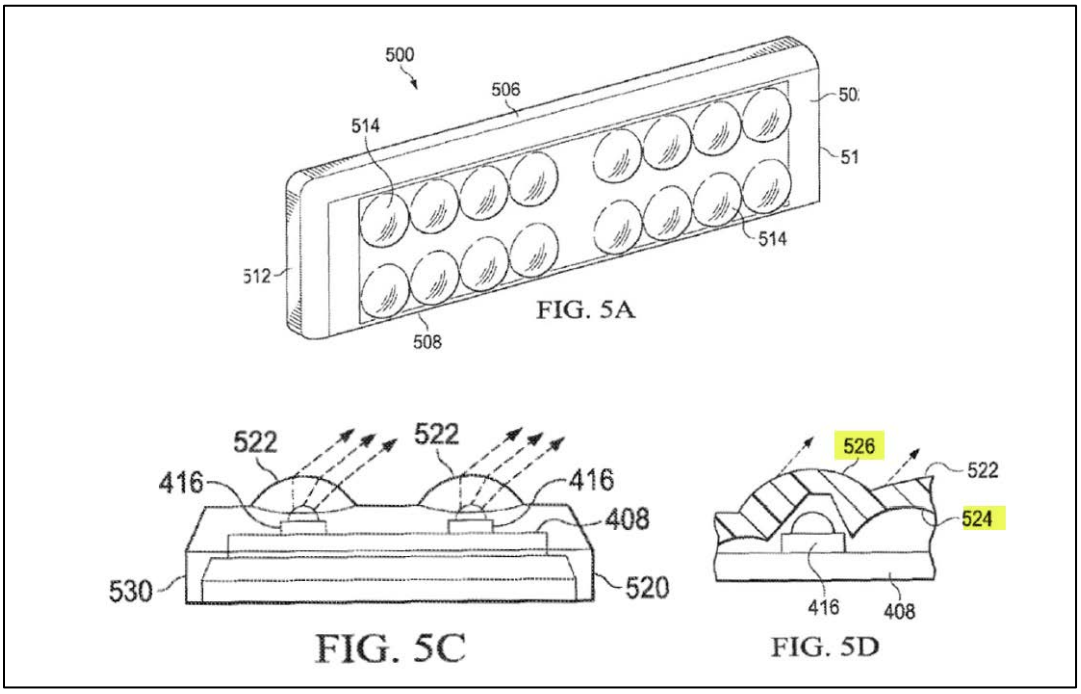
Plaintiff replies that Figure 5D shows the detail of the lens structure 522, which includes "an interior surface 524 and an exterior surface 526 that shapes and directs the light in the correct pattern." Dkt. No. 99 at 4 (citing '410 Patent at 5:43–46). Plaintiff argues that Defendants improperly limit the claims to the embodiments shown in Figures 8A–J. *Id*. at 5. Plaintiff contends

that Defendants' proposal would read the word "element" out of the claims and should therefore be rejected. *Id*.

2. Analysis

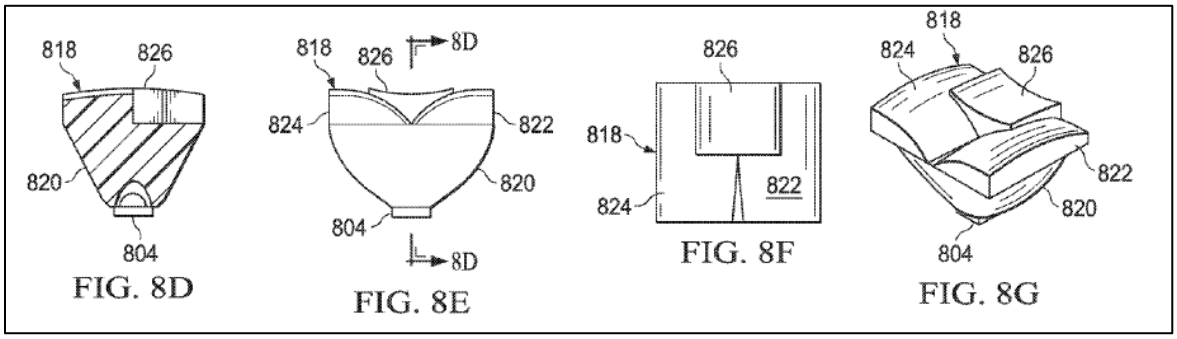
The phrase "[each of the plurality of optical elements comprises] a first lens element and a second lens element disposed over the first lens element" appears in asserted Claims 1, 16, and 22 of the '410 Patent; and Claims 3, 7, and 13 of the '413 Patent. The Court finds that the phrase is used consistently in the claims and is intended to have the same general meaning in each claim. The Court further finds that the phrase should be given its plain and ordinary meaning, with the understanding that the Court rejects both sides' proposals as discussed further below.

Plaintiff contends that a "surface" of a lens is the recited "lens element." Specifically, Plaintiff points to Figure 5D and argues that it shows the detail of the lens structure 522, which includes "an interior surface 524 and an exterior surface 526 that shapes and directs the light in the correct pattern." Dkt. No. 99 at 4.



'410 Patent at Figs. 5A, 5C, 5D (highlighting added). The problem with Plaintiff's argument is

that the Asserted Patents use the disputed term "lens element" only in connection with the embodiment of Figures 8A-J. These figures illustrate and identify different geometric shapes (820, 822, 824, 826), not the surfaces, as the "lens elements."



Id. at Figs. 8D, 8E, 8F, 8G. Regarding these figures, the specification states the following:

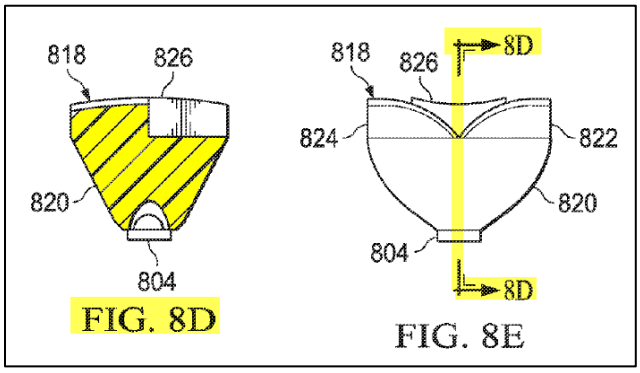
> As shown in FIGS. 8D-8H, a single optical element 806 may include multiple lens elements designed to distribute the illumination provided by a single LED 804 across a surface such as the surface 102 of FIG. 1. A first lens element 820 may be positioned proximate to the LED 804, and additional lens elements 822, 824, and 826 may be positioned above the lens element 820. Multiple optical elements 806 may be combined and formed as a single optics panel 604 that is configured to operate with the LED assembly 800.

Id. at 8:6–15. In contrast to this description, the specification states that Figures 5A–D depict a "lens panel 500" that "may include multiple optical elements 514." *Id*. at 4:64–65. The specification does not use the term "lens element" to describe any component of these figures. Instead, the specification describes items 526 and 524 as "surfaces," not "lens elements." *Id*. at 5:43–48. Thus, the Court rejects Plaintiff's argument that a "surface" is a "lens element," because it is inconsistent with the intrinsic evidence and would read "lens element" out of the claims.

The Court also rejects Defendants' construction because it requires the "first lens element" and the "second lens element" to be "distinct lens structures." This would require the "optical element" to be an assembly of these distinct lens elements. Contrary to Defendants' contention, the specification does not describe optical element 804 as an assembly of distinct structures. Instead, the specification describes the optical element as comprised of multiple lens elements, not

multiple lenses. *Id*. at 8:6–7 ("[A] single optical element 806 may include multiple lens elements"). Stating that a single optical element may include "multiple lens elements" is not a requirement for an assembly of distinct structures, as Defendants' construction would require. Indeed, the purpose of the multiple lens elements is "to distribute the illumination provided by a single LED 804 across a surface such as the surface 102 of FIG. 1." *Id*. at 8:7–9. This may include embodiments where "substantially all illumination from a lighting assembly 110 [is directed] evenly across the surface 102 while some illumination is not evenly distributed." *Id*. at 6:31–34.

To be sure, there is no discussion of a method of assembly or indication that the optical element must be an assembly of distinct structures. Figure 8D illustrates optical element 806 as a single piece by including hatching throughout the entire cross-section. *Id*. at 8:6–9 ("As shown in FIGS. 8D-8H, a single optical element 806 may include multiple lens elements designed to distribute the illumination provided by a single LED 804 across a surface such as the surface 102 of FIG.1.").



'410 Patent at Fig. 8D, 8E (highlighting added). Thus, a person of ordinary skill in the art would understand that Figures 8D–8H illustrate a unitary optical element, and not an assembly of distinct elements. That said, there is nothing that prevents the optical element from being an assembly of distinct lens elements, as Defendants propose. However, the intrinsic evidence does not require it, and it would be improper to read this requirement into the claims.

Defendants also argue that one piece of extrinsic evidence states that the "name 'element' always refers to a single piece of glass having polished surfaces, and a complete lens thus contains one or more elements." Dkt. No. 98-5 at 4. The Court first notes that the generic term "element" is not the same term as the recited "lens element" or "optical element." Thus, this extrinsic evidence may be interpreted to mean that the "optical element" is a "single piece of glass having polished surfaces" made up of multiple internal lens elements, which would contradict Defendants' position. Moreover, the plain language of the claim requires the "optical element" to have a "first lens element" and a "second lens element" (*i.e.*, one or more elements). Therefore, the second portion of this statement is unhelpful. Most importantly, this extrinsic evidence explicitly acknowledges that the usage of the terms "elements," "lens," "system," and "component" are "not standardized and the reader must judge what is meant when these terms appear in a book or article." *Id.*

Having resolved the parties' dispute, the Court finds no further construction is necessary. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("[D]istrict courts are not (and should not be) required to construe *every* limitation present in a patent's asserted claims.").

3. Court's Construction

For the reasons set forth above, the phrase "[each of the plurality of optical elements comprises] a first lens element and a second lens element disposed over the first lens element" is given its plain and ordinary meaning.

B. Uniformity Terms

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"substantially equal level of illumination" • '410 Patent Claims 1, 15, 21	"does not create noticeable unevenness, such as hot spots and dead spots"	Indefinite
"is substantially uniform" • '410 Patent Claim 10	"does not create noticeable unevenness, such as hot spots and dead spots"	Indefinite
"remains substantially unchanged" • '410 Patent Claim 3	"does not create noticeable unevenness, such as hot spots and dead spots"	Indefinite
"remains substantially the same" • '738 Patent Claims 19, 20 • '946 Patent Claim 12	"does not create noticeable unevenness, such as hot spots and dead spots"	Indefinite

1. The Parties' Positions

The parties dispute whether the Uniformity Terms are indefinite. Defendants argue that these terms are indefinite based on their use of the term "substantially," and the contradicting descriptions of uniform/even illumination in the specification. Dkt. No. 98 at 10. Defendants contend that the patentees use two conflicting descriptions to explain uniform or even illumination. *Id*. at 11 (citing '410 Patent at 2:55–61, 5:14–16). Defendants argue that the disclosed "3:1 uniformity" would not alleviate the presence of hot spots or dead spots. *Id*. (citing Dkt. No. 96-10 at ¶¶ 59-62). Defendants also contend that the 3:1 ratio can be achieved with the presence of a single absurdly bright, but small hot spot because the ratio compares the minimum to an "average," as opposed to a maximum. *Id*. at 11–12.

Defendants further argue that industry publications further confirm Dr. Josefowicz's opinions. *Id*. at 12 (citing Dkt. No. 96-10 at ¶ 63; Dkt. No. 98-7 at 3). According to Defendants, it was understood in the field that limiting the maximum brightness to just two times the minimum

brightness is the "starting point" to prevent hot spots. *Id*. (citing Dkt. No. 96-9 at ¶ 81). Defendants argue that the Lighting Handbook, relied upon by Dr. Coleman, proposes using an illuminance ratio of 3:1 to highlight features in the foreground and draw the viewer's attention away from the darker background. *Id*. (citing Dkt. No. 96-10 at ¶ 62; Dkt. No. 98-10 at 7). According to Defendants, a person of ordinary skill in the art could not reconcile the patents' disclosures, which Defendants argue both preclude but inherently allow hot spots on a "uniformly" illuminated surface. *Id*. at 13 (citing '410 Patent at 2:49–64, 5:14–16; Dkt. No. 96-10 at ¶ 54).

Defendants further contend that the patentees' addition of the term "substantially" to qualify the amount of illumination exacerbates the problem because the specification does not provide any guidance for understanding the degree to which the light intensity across the entire display surface may depart from "uniform" and still be "substantially uniform." *Id*. Defendants argue that the '410 Patent provides no "guidance for understanding the degree" of uniformity because it cannot reconcile the contradiction. *Id*. at 14. According to Defendants, the additional term of degree only adds to the failure to inform a person of ordinary skill in the art of the invention's scope. *Id*.

Plaintiff argues that the disputed terms must be considered in the context of the overall claim as a whole and not in a vacuum. Dkt. No. 96 at 20. Plaintiff contends that the context of the claim as a whole provides reasonable certainty to one of ordinary skill in the art about the scope of the invention because it describes in detail the structure used to reach the desired objective of "substantially uniform" light intensity across a display surface of a billboard. *Id*. at 20-21 (citing '410 Patent at 9:5–17, 10:60–61). Plaintiff further contends that the specification explains how a person of ordinary skill in the art recognizes when the illumination is not uniform. *Id*. (citing '410 Patent at 2:49–55, 2:55–61, 5:33–35). Plaintiff also argues that the specification explains how the

LED light assembly uniformly illuminates a billboard to avoid these hot spots and dead spots. *Id.* at 21-22 (citing '410 Patent at 1:27–29, 6:21–23, 5:37–38, Figs. 5A–5D and 8D–8J).

Finally, Plaintiff argues that extrinsic evidence also supports its position that this term is not indefinite. *Id.* at 23 (citing Dkt. No. 96-17 at 7). Plaintiff contends that the extrinsic evidence shows that there are commonly understood criteria in the art for determining the uniformity of the light intensity for LED lighting in the context of noticeable unevenness, such as hot spots or dead spots on the surface that is being illuminated. *Id.* (citing Dkt. No. 96-9 at ¶ 53).

Regarding Defendants' argument, Plaintiff contends that the specification does not contain a conflict. Dkt. No. 99 at 5. Plaintiff argues that the patents teach the person of ordinary skill that the terms are not defined in the context of a formula or ratio. *Id.* According to Plaintiff, the 3:1 ratio relied upon by Defendants is not the "definition" of even illumination, as it appears in dependent claims as an additional limitation related to the uniformity ratio. *Id.* (citing '410 Patent at Claims 5, 14, 21). Plaintiff argues that a 3:1 ratio of average illumination to minimum illumination is one example of a measurement that would fall within that understanding. *Id.* at 5–6. Plaintiff contends that Defendants' lexicography argument should be rejected. *Id.* at 6.

2. Analysis

The phrase "substantially equal level of illumination" appears in Asserted Claims 1, 15, and 21 of the '410 Patent. The Court finds that the phrase is used consistently in the claims and is intended to have the same general meaning in each claim. The phrase "remains substantially the same" appears in Asserted Claims 19 and 20 of the '738 Patent; and Claim 12 of the '946 Patent. The phrase "is substantially uniform" appears in Asserted Claim 10 of the '410 Patent. The phrase "remains substantially unchanged" appears in Asserted Claim 3 of the '248 Patent. The Court finds that this group of phrases is used consistently in the claims and is intended to have the same general

meaning in each claim.

"[A] patentee need not define his invention with mathematical precision in order to comply with the definiteness requirement." *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1384 (Fed. Cir. 2005) (citation omitted). Here, the disputed terms are terms of degree. "Claim language employing terms of degree has long been found definite where it provided enough certainty to one of skill in the art when read in the context of the invention." *Interval Licensing*, 766 F.3d at 1370 (citing *Eibel Process Co. v. Minn. & Ont. Paper Co.*, 261 U.S. 45, 65–66 (1923)). The 3:1 ratio relied upon by Defendants is not the "definition" of even illumination. Indeed, it appears in dependent claims as an additional limitation related to the uniformity ratio. '410 Patent at Claim 5 ("wherein the uniformity ratio is 3:1"), *see also id*. at Claims 14 and 21.

Like the disputed term "visually negligible" in *Sonix Tech. Co. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1378 (Fed. Cir. 2017), the Uniformity Terms involve what can be seen by the normal human eye. This provides an objective baseline through which to interpret the claims. It does not turn on a person's taste or opinion, and is not purely subjective. *Id*. Indeed, the specification discloses how a person of ordinary skill in the art recognizes when the illumination is not uniform. The specification states that prior art lighting technology made it difficult to direct light uniformly. '410 Patent at 2:49–55. The specification explains that this uneven illumination creates "hot spots" (*i.e.*, bright spots) that are undesirable:

> One problem with uneven illumination is that certain parts of the surface 102 may be more brightly illuminated than other parts. **This creates "hot spots" that may be undesirable**. Attempting to evenly illuminate the surface 102 may cause light to be directed past the edges 112, 114, 116, and 118 as attempts are made to balance out hot spots in particular areas.

Id. at 2:55–61 (emphasis added). The specification further contrasts these "hot spots" with "dead spots" (*i.e.*, dark spots) on the billboard surface: "[t]he minimum distance is designed such that overlapping light from adjacent LEDs does not create interference patterns and result in dead spots

on the surface." *Id*. at 5:33–35.

The specification discloses how the LED light assembly uniformly illuminates a billboard to avoid these hot spots and dead spots. The specification describes directing the illumination to "minimiz[e] any noticeable unevenness in the overall illumination, even if one of the remaining LEDs 416 malfunctions" to realize the benefit of overlapping and redundant coverage on the billboard. *Id*. at 6:21–23. The specification further describes and illustrates embodiments of optical elements that are designed to create the "substantially uniform" light intensity on the billboard surface. *See, e.g., id*. at 5:37–38 ("the lens structure is designed to 'direct' the light from an edge of the surface to cover the entire surface"), Figs. 5A–5D and 8D–8J.

The specification also explains that light from the LEDs is directed by these optical elements "so that each LED illuminates substantially the entire surface with a substantially equal level of illumination per LED," and "minimiz[es] any noticeable unevenness in the overall illumination" *Id*. at 1:27–29, 6:21–23. Taken together, these portions of the specification inform a person of ordinary skill in the art about the scope of the invention with reasonable certainty. Therefore, the claims including these terms are not indefinite because when "viewed in light of the specification and prosecution history, [the claims] inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus*, 572 U.S. at 910.

Defendants further argue that the patentees' addition of the term "substantially" to qualify the amount of illumination "exacerbates the problem because the specification does not provide any guidance for understanding the degree to which the light intensity across the entire display surface may depart from 'uniform' and still be 'substantially uniform.'" Dkt. No. 98 at 13. The Court disagrees since the meaning of "substantially uniform" is reasonably certain in context of the Asserted Patents. As discussed above, terms of degree are not indefinite if the patent provides

some objective standard for measuring the degree. Here, "substantially" is a term of degree, and the Asserted Patents provide a standard for measuring that degree. For example, the specification explains that "substantially uniform" involves what can be seen by the normal human eye by "minimizing any noticeable unevenness in the overall illumination" '410 Patent at 6:21–23.

In an attempt to distinguish *Max Blu Techs., LLC v. Cinedigm Corp.*, 2016 U.S. Dist. LEXIS 89790, *78–81 (E.D. Tex. July 12, 2016), Defendants argue that the specification includes a contradictory description. Dkt. No. 98 at 14. In *Max Blu Techs.*, the defendant argued "that the word 'substantially' [in the claim term "substantially flat and coplanar"] render[ed] the term indefinite as 'substantially' is a term of degree and the Asserted Patents do not provide any guidance for measuring that degree." *Id.*, at *76. This Court disagreed, holding that "the patents provide[d] sufficient guidance for understanding the degree of flatness and coplanarity in that they describe the technological purpose for having flat and coplanar land tops—for use in flying head applications." *Id.*, at *80.

This type and level of guidance is provided in the '410 Patent for the Uniformity Terms. The specification explains that the purpose of having light uniformity is to prevent "hot spots" (*i.e.*, bright spots) that cause limited visibility and legibility of the advertising content, and "minimiz[es] any noticeable unevenness in the overall illumination" '410 Patent at 2:49–61, 6:21–23. As discussed, the purported contradictory description of the 3:1 ratio relied upon by Defendants is not the "definition" of even illumination.

3. Court's Construction

For the reasons set forth above, the Court finds that the term(s):

- "substantially equal level of illumination" means "level of illumination that does not create noticeable unevenness in the overall illumination, such as hot spots or dead spots";

- "is substantially uniform," "remains substantially unchanged," and "remains substantially the same" mean "does not create noticeable unevenness in the overall illumination, such as hot spots or dead spots."

C. "substantially transparent"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"substantially transparent" • '410 Patent Claims 1, 13 • '413 Patent Claims 5, 11, 18	plain and ordinary meaning or, in the alternative "clear"	Indefinite

1. The Parties' Positions

The parties dispute whether the term "substantially transparent" is indefinite. Defendants argue that the transparency of a substrate is a critical design element of optical lenses used in LED lighting products to direct LED radiation. Dkt. No. 98 at 14 (citing Dkt. No. 96-10 at ¶¶ 28, 31). Defendants contend that a person of ordinary skill in the art has a multitude of techniques to determine the level of transparency of a lens substrate. *Id*. (citing Dkt. No. 96-10 at ¶ 31). According to Defendants, there is no industry standard for determining what it means to be "substantially transparent," and the specification does not provide any guidance to determine how transparent is substantially transparent. *Id*. (citing Dkt. No. 96-10 at ¶ 32, '410 Patent at Abstract, 1:21–25, 5:26–29). Defendants argue that a person of ordinary skill in the art using a substrate material that deviates from a transparent substrate by passing 95% of the light would not know whether it qualifies as "substantially transparent." *Id*. at 15.

Defendants further argue that neither Plaintiff nor its expert are able to articulate a meaning of "substantially transparent" that is anything different than the meaning of "transparent." *Id*. (citing Dkt. No. 96-10 at ¶ 33; Dkt. No. 96-9 at ¶¶ 34, 36, 37). Defendants contend that words used to define "transparent" itself cannot define "substantially" in the context of "substantially

transparent." *Id*. at 16. Defendants argue that Plaintiff's attempt to read "substantially" out of the claim to save it from indefiniteness should be rejected. *Id*. Defendants also argue that there are varying levels of transparency such that qualifying it with "substantially" without providing guidance on how opaque the substrate can be renders the term indefinite. *Id*. (citing Dkt. No. 96-10 at ¶ 29). Defendants contend that the claims are indefinite because it is not possible to articulate a construction that provides meaning to all the terms. *Id*. at 17.

Plaintiff argues that the specification describes the substrate on which the lenses are formed as either "transparent" or "substantially transparent." Dkt. No. 96 at 11 (citing '410 Patent at Abstract, 1:21–28, 5:26–29). Plaintiff contends that a person of ordinary skill in the art would have understood that the phrase "substantially transparent" as used in the claims refers to the substrate that forms the optical elements being transparent or clear as opposed to diffusing or light scattering. *Id*. (citing Dkt. No. 96-9 at ¶ 34).

Plaintiff further contends that it is extraordinarily difficult to create an optical element with a complete absence of imperfections, and thus, a lens with 100% transparency is effectively not possible. *Id*. at 11–12 (citing Dkt. No. 96-9 at ¶ 35). According to Plaintiff, there would need to be some sort of mechanism to attach the substrate to the rest of the luminaire, such as a glue or screws, which are not transparent. *Id*. at 12 (citing Dkt. No. 96-9 at ¶ 35). Plaintiff further contends that the process of injection molding the substrate may leave small surface artifacts, which may not be transparent. *Id*. (citing Dkt. No. 96-9 at ¶ 35). Plaintiff argues that "substantially" is used in the claim to reflect the realities of manufacturing and designing the claimed substrate. *Id*. at 14.

Plaintiff further argues that its proposal is consistent with the extrinsic evidence. *Id*. at 12 (citing Dkt. No. 96-12; Dkt. No. 96-13; Dkt. No. 96-9 at ¶¶ 37–38). Plaintiff also contends that its alternative proposal "clear" is also supported by the evidence. *Id*. at 13 (citing Dkt. No. 96-9 at ¶

38; Dkt. No. 96-13). According to Plaintiff, a failure to provide a precise percentage of light transmission does not render the claim indefinite. *Id*. at 14. Plaintiff further argues that Defendants' expert, Dr. Josefowicz, admitted that a person of ordinary skill in the art would understand that optics have a particular transparency, and that the materials used to create lenses have some surface roughness which can scatter light, as well as voids and defects in the material that can cause some scattering. *Id*. (citing Dkt. No. 96-14 at 73:25–74:9, 76:24–77:22). Plaintiff also argues that Dr. Josefowicz admitted that no material is 100% transparent. *Id*. at 15 (citing Dkt No. 96-14 at 118:13–15). According to Plaintiff, the use of the term "substantially" recognizes the engineering realities that there is no such thing as perfect transparency. Dkt. No. 99 at 7.

2. Analysis

The term "substantially transparent" appears in Asserted Claims 1 and 13 of the '410 Patent; and Claims 5, 11, and 18 of the '413 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The Court further notes that the parties' experts agree that nothing is 100% transparent. Dkt. No. 96-9 at ¶ 35 ("A person of ordinary skill in the art would understand that from an engineering perspective, it is difficult to impossible to create an optical element without imperfections, such as a very minor scratch, and that the use of the adjective "substantially" in this term is meant to provide for this characteristic of optical elements that would nevertheless be considered "transparent" to a person of ordinary skill in the art but may be slightly less than 100% transparency."); Dkt No. 96-14 at 118:13–15 ("You said earlier that nothing is 100 percent transparent, correct? A: Yes.")). With this understanding, the Court turns to the intrinsic evidence.

The claim language does not provide explicit guidance as to how much scattering is allowed before the material is no longer considered "substantially transparent." However, the

specification indicates that the patentee used the term "substantially transparent substrate" and the term "transparent substrate" interchangeably. Specifically, the Abstract states the following:

> An optics panel for use in a light emitting diode (LED) lighting is disclosed. A plurality of LEDs is disposed on a substrate and directed outward therefrom. A **substantially transparent substrate** is disposed over the plurality of LEDs and configured to direct light from each of the plurality of LEDs of the lighting assembly onto a surface having a predetermined bounded area. Light from each of the LEDs is directed by **the transparent substrate** across the entire area of the surface so that each LED illuminates substantially the entire surface with a substantially equal level of illumination per LED.

'410 Patent at Abstract (emphasis added). The Summary section of the specification also includes the same description when describing "the present invention." *Id*. at 1:16–29. Likewise, in describing the lens assembly illustrated in Figure 5C, the specification states that "[o]verlying the board and LEDs 416 is transparent lens substrate 520." *Id*. at 5:28–29. Accordingly, the Court finds that a person of ordinary skill would understand that the terms "substantially transparent substrate" and "transparent substrate" are used interchangeably to account for the engineering reality that there is no such thing as perfect transparency.

During the claim construction hearing, Defendants argued that the Court is reading the term "substantially" out of the claims. The Court disagrees since nothing is 100% transparent. Moreover, claim constructions are "simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims." *Embrex, Inc. v. Serv. Eng'g. Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000) (brackets removed) (citation omitted). Although claim constructions should elaborate on the meaning of claim terms, they should not become elaborate. Indeed, their purpose is to guide the jury in applying the elements of a claimed invention to specific aspects of an accused device. Hence, there is a heavy presumption that the terms used in claims "mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art." *SuperGuide Corp. v. DirecTV Enters., Inc.*,

358 F.3d 870, 874–75 (Fed. Cir. 2004) (citation omitted). Accordingly, based on the intrinsic evidence, the Court construes "substantially transparent" to mean "transparent" because this construction is detailed enough to assist the jury in understanding the claims. Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

3. Court's Construction

For the reasons set forth above, the Court finds that the term:

- "substantially transparent" means "transparent."

D. "substantially the entire display surface"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"substantially the entire display surface" • '410 Patent Claims 1, 15, 21	plain and ordinary meaning	Indefinite

1. The Parties' Positions

The parties dispute whether the phrase "substantially the entire display surface" is indefinite. Defendants argue that what constitutes substantial in the context of illuminating the entire display is never explained in the intrinsic record. Dkt. No. 98 at 17–18. Defendants' expert, Dr. Josefowicz, opines that the specification fails to provide the necessary "guidance in the field of lighting on which a POSITA would rely to assess how much of a display surface must be illuminated to qualify as 'substantially the entire display surface.'" *Id.* at 18 (citing Dkt. No. 96-10 at ¶¶ 36, 38–42; '410 Patent at Abstract, 5:36–38, 5:46–48, 5:50–64, 5:65–6:4, 6:44–47, 2:23–27, 5:21–25, 6:12–20, 6:23–30, 1:25–29).

Defendants further argue that Plaintiff fails to identify any specific disclosure in the intrinsic record that would inform a person of ordinary skill in the art with reasonable certainty the

scope of "substantially the entire display surface." *Id*. Defendants contend that Plaintiff's only support is its expert's opinion that specific uncertainties are covered by "substantially" in the claim. Defendants respond that those opinions actually confirm the "zone of uncertainty" surrounding the claim. *Id*. Defendants further contend that this claim term is not directed to components of a machine for which it would be appropriate to have design and manufacturing tolerances. *Id*. at 19. Defendants also argue that there are no industry standards for illumination tolerances, imperfections and installation issues, and therefore, these provide no guidance to inform a person of ordinary skill in the art of the bounds of "substantially the entire display surface." *Id*. (citing Dkt. No. 98-2 at at 64:18–65:5, 67:20–69:8, 69:9–16, 69:22–70:15).

Defendants also contend that Dr. Josefowicz's testimony demonstrates that a person of ordinary skill in the art cannot know the metes and bounds of "substantially the entire display surface." *Id*. (citing Dkt. No. 98-11 at 169:11–15). Defendants argue that Plaintiff's description of each LED's "even" illumination of the "entire display surface" is not relevant because it does not address what is meant by "substantially the entire display surface," and improperly reads the word "substantially" out of the claim. *Id*. at 20. Defendants also argue that Plaintiff's purported "technical purpose, preventing the display surface from uneven lighting in the event of an LED failure," in no way informs a person of ordinary skill in the art of the scope of the term. *Id*. According to Defendants, nothing in the claim suggests that the entire display surface needs to be illuminated when all LEDs are operating, and only "substantially the entire display surface" needs to be evenly illuminated otherwise. *Id*.

Plaintiff argues that "a person of ordinary skill in the art would understand that these claims are directed to the requirement that each LED must individually provide even illumination to the entire display surface rather than each LED only providing illumination to a portion of the display

surface, or each LED providing greater illumination in some areas of the display surface and less illumination in other areas." Dkt. No. 96 at 18 (citing Dkt. No. 96-9 at ¶ 41). Plaintiff contends that the claim uses the phrase "substantially" in recognition of the real-world engineering problems encountered in optics. *Id*. According to Plaintiff, there may be design tolerances, manufacturing tolerances or imperfections, or installation issues that may cause an insubstantial portion of the display surface, such as the trim on a billboard display, to not be illuminated by every LED. *Id*. (citing Dkt. No. 96-9 at ¶ 41). Plaintiff further argues that a person of ordinary skill in the art would understand that the scope of the claims do not cover an apparatus where each LED illuminates an individual point on the display surface. *Id*. at 18–19 (citing Dkt. No. 96-16).

Plaintiff also argues that Defendants' expert had no issue testifying that he could tell that substantially the entire display surface was evenly lit. Dkt. No. 99 at 7 (citing Dkt. No. 96-14 at 167:5–9, 165:19–169:15). Plaintiff concedes that the specification does not provide a precise amount of display area not illuminated by each LED. Dkt. No. 96 at 19. However, Plaintiff argues that the specification describes the technical purpose for having this feature, which is preventing the display surface from uneven lighting in the event of an LED failure. *Id*. Plaintiff contends that absolute precision in patent claiming is impossible, and that a person of ordinary skill in the art would understand that the "spot illumination" claimed in the prior art is different from the concept claimed here. Dkt. No. 99 at 7.

2. Analysis

The phrase "substantially the entire display surface" appear in Asserted Claims 1, 15, and 21 of the '410 Patent. The Court finds that the phrase is used consistently in the claims and is intended to have the same general meaning in each claim. The Court further finds that the phrase "substantially the entire display surface" is not indefinite because when "viewed in light of the

specification and prosecution history, [the claim] inform[s] those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus*, 572 U.S. at 910.

Claim 1 of the '410 Patent requires the light to be directed "through the first lens element and the second lens element across the entire area of the display surface so that each LED evenly illuminates *substantially the entire display surface* with a substantially equal level of illumination from each of the LEDs." '410 Patent at 8:46–48 (emphasis added). Similarly, the specification states that "the optical elements 514 are configured so that the light emitted from each LED 416 is projected onto the *entire surface 102 of the billboard 100*." *Id.* at 5:4–6 (emphasis added). The specification provides that the reason for this is "if all other LEDs 416 were switched off except for a single LED 416, *the entire surface 102* would be illuminated at the level of illumination provided by the single LED 416." *Id.* at 5:6–9 (emphasis added). In other words, "[w]hen one or more LEDs fail, the overall illumination decreases, but the uniformity maintains the same uniformity." *Id.* at 5:19–21.

The issue with this phrase is related to the Uniformity Terms in that it is ultimately what can be seen by the normal human eye. Like the disputed term "visually negligible" in *Sonix*, the phrase "substantially the entire display surface" involves what can be seen by the normal human eye. This provides an objective baseline through which to interpret the claims, and does not turn on a person's taste or opinion, nor is it purely subjective. *Sonix*, 844 F.3d at 1378. Indeed, Defendants' expert was able to tell that substantially the entire display surface was evenly lit when shown a picture of a lit road sign at his deposition. Dkt. No. 96-14 at 167:5–9 (Q: Is substantially the entire display surface lit? A: It looks like it, because the white border is fully lit, yeah.").

Similarly, the situation comports with this Court's analysis in *Max Blu*. Although the specification does not provide a precise amount of display area not illuminated by each LED, it

does describe the "technical purpose" for having this feature. *Max Blu*, 2016 U.S. Dist. LEXIS 89790, at *80. The technical purpose of preventing the display surface from uneven lighting in the event of an LED failure, is consistent with the statements in the specification and the file history.

Specifically, the "spot illumination" claimed in the prior art is different from the claim language. During prosecution of the '410 Patent, the claims were rejected over an obviousness combination of U.S. Publication No. 2004/0004827 to Guest ("Guest") and U.S. Patent No. 7,896,522 to Heller *et al*. ("Heller"). The patentee argued that Guest and Heller were not combinable because "Guest teaches producing a uniform light output using multiple reflections (crisscrossing of light beams) while Heller teaches *using separate focused light for illuminating different parts of the output*." Dkt. No. 96-16 at 4. Claim 1 of the '410 Patent, with emphasis added, explicitly recites "evenly illuminates *substantially the entire display surface* with a substantially equal level of illumination from each of the LEDs." This is different than the prior art's focused lighting on different parts of the display.

Defendants argue that Dr. Josefowicz's complete response during his deposition identifies that not only is the display "fully lit" to the "white border," but that there is significant spillage of light beyond the border such that the pole holding the sign is also lit. Dkt. No. 98 at 20. Defendants' argument confirms the Court's analysis. The phrase "substantially the entire display surface" involves what can be seen by the normal human eye. A person of ordinary skill can look at the borders of the display surface to determine that *substantially the entire display surface* is illuminated.

Defendants also argue that the term is indefinite because it leaves a person of ordinary skill in the art with unreasonable uncertainty as to how much of the display surface needs to be illuminated. Dkt. No. 98 at 18. The Court disagrees because in the context of the Asserted Patents,

the meaning of "substantially the entire display surface" is reasonably certain. As discussed above, terms of degree are not indefinite if the patent provides some objective standard for measuring the degree. Here, the Asserted Patents provide a standard for measuring that degree. Therefore, the claim including the phrase "substantially the entire display surface" is not indefinite because when "viewed in light of the specification and prosecution history, [the claims] inform[s] those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus*, 572 U.S. at 910. Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

3. Court's Construction

For the reasons set forth above, the Court finds:

- "substantially the entire display surface" means "the entire display surface."

E. "areas beyond [the] edges . . . receive substantially no illumination"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"areas beyond edges . . . receive substantially no illumination" • '410 Patent Claims 7, 12, 19, 25 • '413 Patent Claims 2, 17	plain and ordinary meaning	Indefinite

1. The Parties' Positions

The parties dispute whether the phrase "areas beyond edges . . . receive substantially no illumination" is indefinite. Defendants argue that the term "substantially" as a descriptor of "no illumination" is an indefinite term of degree. Dkt. No. 98 at 21. Defendants contend that this term relates to avoiding "light pollution" that results from light extending beyond edges of a display. *Id*. Defendants further contend that what constitutes light pollution is purely subjective and will mean different things to different people. *Id*. (citing Dkt. No. 98-13 at 4, 7). Defendants argue that

the patent does not provide guidance as to what it means to have substantially no illumination beyond the edges of the area. *Id*.

Defendants also argue that a person of skill in the art making a device would not know when a product is infringing. *Id*. at 22. Defendants contend that Plaintiff's expert concedes that whether there is an insubstantial amount of light will depend on both the location and the environment in which the claimed optics panel and billboard are used. *Id*. (citing Dkt. No. 98-2 at 83:23–89:11). According to Defendants, a person of ordinary skill in the art would not know if a product meets this limitation until after a particular environment is selected for its use. *Id*. Defendants also contend that infringement may also change with the conditions of the environment. *Id*. Defendants argue that this type of claim language is indefinite because it is not "sufficiently precise to permit a potential competitor to determine whether or not he is infringing." *Id*. (citing *PureChoice, Inc. v. Honeywell Int'l Inc.*, No. 2:06-cv-244, 2008 WL 190317, at *7 (E.D. Tex. Jan. 22, 2008)).

Plaintiff argues that the term "substantially no illumination" is related to areas beyond the edges of the display surface, where incident light is not desirable. Dkt. No. 96 at 24. Plaintiff contends that the specification provides guidance to a person of ordinary skill in the art as to the meaning of these terms. *Id*. (citing '410 Patent at 2:61–64). According to Plaintiff, a person of ordinary skill in the art would understand that illumination areas beyond the display surface are referred to as "light trespass," which causes light pollution, and occurs when an "[a]djacent property receives unwanted light," such as when light is not properly or adequately "[c]ontain[ed] [] within the design area." *Id*. at 24-25 (citing Dkt. No. 96-17 at 6).

Plaintiff contends that the different types of light trespass and light pollution are known, as are the limits of what is considered acceptable. Dkt. No. 99 at 8 (citing Dkt. No. 96-9 at ¶¶ 56–

58). Plaintiff further argues that light trespass is avoided by preventing any light other than an insubstantial amount from illuminating areas beyond the edges of a display surface. Dkt. No. 96 at 25 (citing Dkt. No. 96-9 at ¶¶ 63–64). Plaintiff contends that the specification makes clear that "substantially no illumination" refers to substantially no wasted light. Dkt. No. 99 at 8 (citing '410 Patent at 2:61–64, 5:9–14). Plaintiff further argues that if a single photon of light spills outside the display surface it would be understood by a person of ordinary skill in the art to not be "light trespass." Dkt. No. 96 at 25 (citing Dkt. No. 96-9 at ¶ 64). According to Plaintiff, "substantially" recognizes the engineering realities that there can never be zero spill light. Dkt. No. 99 at 8. Plaintiff contends that person of ordinary skill in the art would understand the conditions under which light trespass would be problematic. Dkt. No. 99 at 8 (citing Dkt. No. 96-9 at ¶¶ 57–64).

2. Analysis

The phrase "areas beyond edges . . . receive substantially no illumination" appears in Asserted Claims 7, 12, 19, and 25 of the '410 Patent; and claims 2 and 17 of the '413 Patent. The Court finds that the phrase is used consistently in the claims and is intended to have the same general meaning in each claim. The Court further finds that the term "substantially no illumination" is used in dependent claims in the context of defining areas where light is not desirable (*i.e.*, light trespass or light pollution). For example, Claim 7 of the '410 Patent states that "areas beyond edges of the display surface receive substantially no illumination from each of the LEDs." Thus, each usage in the claims is related to areas beyond the edges of the display surface where incidental light is not desirable.

Indeed, the Asserted Patents discuss problems associated with light being directed outside of the target area. The specification states that "light that does not strike the surface 102 is wasted and may create problems (e.g., light pollution), as well as waste illumination that could be used

for the surface 102." '410 Patent at 2:61–64. The specification further states that "[i]n one embodiment, the rectangular target area of the surface 102 would be evenly illuminated by the LED 416, while areas beyond the edges 112, 114, 116, and 118 would receive *no illumination at all or at least a minimal amount of illumination* from the LED 416." *Id*. at 5:9–14 (emphasis added). Accordingly, the Court finds that the phrase "areas beyond edges . . . receive substantially no illumination" should be construed to mean "areas beyond edges . . . receive no noticeable illumination."

Defendants argue that what constitutes light pollution (or light trespass) is purely subjective and will mean different things to different people. Dkt. No. 98 at 21. According to Defendants, IES RP-33-99 explains that light pollution or trespass is "extremely subjective." *Id*. (citing Dkt. No. 98-13 at 4, 7). Defendants contend that given the highly subjective nature of light pollution, the claims and/or intrinsic record needs to provide guidance as to what it means to have substantially no illumination beyond the edges of the area. *Id.*

The Court disagrees. As discussed with the Uniformity Terms, the Court's construction captures what can be seen by the normal human eye. This provides an objective baseline through which to interpret the claims. It does not turn on a person's taste or opinion, and is not purely subjective. *Sonix*, 844 F.3d at 1378. The construction removes any subjectivity because it requires that "areas beyond edges . . . receive no noticeable illumination."

3. Court's Construction

For the reasons set forth above, the Court finds:

- "areas beyond edges . . . receive substantially no illumination" means "areas beyond edges . . . receive no noticeable illumination."

F. Minimal/Minimum Illumination

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"minimal amount of illumination" • '413 Patent Claims 6, 16	"compliant with IES recommended light trespass guidelines"	Indefinite
"areas beyond edges … receive minimum illumination" • '738 Patent Claim 19	"compliant with IES recommended light trespass guidelines"	Indefinite

1. The Parties' Positions

The parties dispute whether the terms "minimal/minimum illumination" are indefinite. Defendants argue that the term is indefinite because it fails to provide any standard for measuring the degree of "minimal." Dkt. No. 98 at 22–23. Defendants contend that nothing in the specification links the existence of "light pollution" or "wasted illumination" to the terms "minimal amount of illumination" and "areas beyond edges . . . receive minimum illumination." *Id.* at 23. Defendants also argue that Plaintiff's reliance on industry publications on light trespass is misplaced. *Id*. (citing Dkt. No. 96-10 at ¶ 71).

Defendants further argue that Plaintiff admits that the IES guidelines are different depending upon where the device may be located at any given time, or what time of day or night it is. *Id*. Defendants contend Plaintiff's construction cannot be correct because it fails to inform a person of ordinary skill in the art as to which guideline is to be used, e.g., for what area or time of day, is intended as the standard. *Id*. at 24.

Plaintiff argues that a person of ordinary skill in the art would be familiar with the desirability of providing illumination only on the desired surface, and not beyond its edges. Dkt. No. 96 at 26 (citing '410 Patent at 2:61–64; Dkt. No. 96-9 at ¶ 68). Plaintiff contends that various organizations and industry groups have devoted significant resources to the issue of light trespass,

and developed industry-recognized guidelines regarding the amount of light trespass that is permissible under various circumstances. *Id*. (citing Dkt. No. 96-9 at ¶ 70, Dkt. No. 96-18). Plaintiff argues that these guidelines recognize that different light trespass requirements apply to different areas. *Id*. at 27 (citing Dkt. No. 96-9 at ¶¶ 71–72; Dkt. No. 96-18). According to Plaintiff, these guidelines are a commonly understood standard or criteria in the art for determining the minimum illumination beyond edges of the billboard for LED lighting in the context of avoiding light pollution in the form of light trespass. *Id*. Plaintiff further contends that a person of ordinary skill in the art would understand implementation-specific details given that the light trespass guidelines vary based on location. Dkt. No. 99 at 9.

Plaintiff also argues that the specification of the Asserted Patents provides sufficient guidance for understanding these claim terms. Dkt. No. 96 at 28 (citing ’410 Patent at 5:10–14, 2:61–64). According to Plaintiff, a person of ordinary skill in the art would have understood that the “wasted light” problem described in the specification refers to light trespass. *Id*. (citing Dkt. No. 96-9 at ¶¶ 69–70).

2. Analysis

The phrase “minimal amount of illumination” appears in Asserted Claims 6 and 16 of the ’413 Patent. The phrase “areas beyond edges . . . receive minimum illumination” appears in Asserted Claim 19 of the ’738 Patent. The Court finds that the phrases are used consistently in the claims and are intended to have the same general meaning in each claim. The Court further finds that the phrases are indefinite.

Claim 6 of the ’413 Patent states that “areas beyond edges of the display surface receive minimal amount of illumination from each of the LEDs.” Plaintiff states that the Illuminating Engineering Society (the “IES”) publishes *The Lighting Handbook*, which Plaintiff contends is a

reference that a person of ordinary skill in the art would have been familiar with. Plaintiff argues that these guidelines recognize that different light trespass requirements apply to different areas. Dkt. No. 96 at 27. For example, dense urban areas that already have high levels of light can absorb higher levels of light trespass than national parks. *Id*. Plaintiff further argues that these guidelines also recognize that different levels of light trespass may be appropriate at different times of day/night. *Id*. According to Plaintiff, these guidelines are a commonly understood standard or criteria in the art for determining the minimum illumination beyond edges of the billboard for LED lighting in the context of avoiding light pollution. *Id*. Plaintiff contends that this is relevant because the "wasted light" problem described in the specification refers to light trespass. *Id*. (citing '410 Patent at 5:10–14, 2:61–64).

Defendants correctly note that the extrinsic evidence Plaintiff relies on expressly warns against adopting a set of universal recommended light trespass limitations because the individual observers may find the same light trespass test results objectionable or not objectionable at all. Dkt. No. 98 at 23 (citing Dkt. No. 96-10 at ¶ 71). Moreover, Plaintiff admits that the IES guidelines are different depending upon where the device may be located at any given time ("different light trespass requirement apply to different areas"), or what time of day or night it is. Dkt. No. 96 at 27. According to Defendants, this proves that Plaintiff's construction cannot be correct because it fails to inform a person of ordinary skill as to which guideline is to be used, e.g., for what area or time of day, is intended as the standard. Dkt. No. 98 at 24. The Court agrees that the extrinsic evidence provided by Plaintiff is unhelpful.

The Court further finds that the claims are indefinite because it is unclear which "areas beyond edges of the display surface" receive a minimal amount or minimal illumination. At some point there is an "area" that is beyond the edges of the display that will not receive any

illumination, but there is no way to determine the scope of that "area" with reasonable certainty. In other words, a person of ordinary skill in the art would not know how close or how far the "area" extends beyond the edges of the display. Accordingly, the phrases are indefinite because when "viewed in light of the specification and prosecution history, [the claims fail] to inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus*, 572 U.S. at 910. Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

3. Court's Construction

For the reasons set forth above, the Court finds the term "minimal amount of illumination" in Claims 6 and 16 of the '413 Patent; and the term "areas beyond edges . . . receive minimum illumination" in Claim 19 of the '738 Patent are indefinite for failing to inform, with reasonable certainty, those skilled in the art about the scope of the invention.

G. "[optics panel is configured to be attached to] a heat sink comprising a power supply enclosure disposed on the heat sink"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"[optics panel is configured to be attached to] a heat sink comprising a power supply enclosure disposed on the heat sink" • '410 Patent Claim 11 • '413 Patent Claim 11	plain and ordinary meaning	"[optics panel is configured to be attached to] a structure for increasing heat dissipation from the optics panel on which a power supply enclosure is placed or arranged" or Indefinite

1. The Parties' Positions

The parties dispute whether the phrase "a heat sink comprising a power supply enclosure disposed on the heat sink" requires construction. Plaintiff contends that Defendants' re-writing of

the claim should be rejected because the claim does not specifically require the heat sink to dissipate heat from the optics panel. Dkt. No. 96 at 29 (citing Dkt. No. 96-9 at ¶ 76). Plaintiff argues that two figures from the specification are informative. *Id*. (citing '410 Patent at 3:64–67, Figs. 3B, 6C).

Plaintiff further argues that Defendants' expert, Dr. Josefowicz, testified that the heat sink may dissipate heat from both the optics panel and power supply in the embodiments of the Asserted Patents. *Id*. (citing Dkt. No. 96-7 at 192:22–24, 194:12–15, 190:21–191:11). Plaintiff contends that there is no dispute that the heatsink in the embodiments of the patents dissipates heat from the heat-generating elements of the panels: the LEDs and the power supply. *Id*. Plaintiff argues that Defendants' construction only introduces an ambiguity and should be rejected. *Id*. at 30.

Defendants respond that they propose a construction that is aligned with the intrinsic record and clarifies that the heat sink dissipates heat from the optics panel to which it is attached in the claim. Dkt. No. 98 at 24. Defendants argue that the '410 and '413 Patents identify heat dissipation as a problem with prior art "LEDs in an exterior lighting environment." *Id*. at 25 (citing '410 Patent at 2:65–67). Defendants further contend that the '410 and '413 Patents propose to solve that problem. *Id*. (citing '410 Patent at 3:18–21, 3:64–4:3, 7:12–16, Fig. 6C). Defendants argue that a person of ordinary skill in the art would understand that the heat sink of Figure 6C is dissipating heat from the LEDs of the optics panel to which it is attached. *Id*. Defendants further argue that a person of ordinary skill in the art would understand that the power supply enclosure is disposed on the heat sink of Figure 6C, as claimed. *Id*. (citing Dkt. No. 98-2 at 119:10–15).

Defendants also contend that Plaintiff's application of the "plain and ordinary meaning" of this limitation is that all of the components of a lighting assembly are "attached" to the optics panel, and that the heat sink need not dissipate heat from the optics panel that includes LEDs. *Id*.

at 26. Defendants argue that Plaintiff's contention is divorced from the specification and the rest of the claim, and also leaves open the question of how can a "heat sink" include an element and still be characterized as a heat sink. *Id*. (citing Dkt. No. 96-10 at ¶ 88).

Plaintiff replies that Defendants create an "inherent ambiguity" in the term where one does not exist. Dkt. No. 99 at 10. Plaintiff contends that there is no ambiguity that the heat sink is attached to it an optics panel and a power supply enclosure. *Id*. According to Plaintiff, the optics panel and the power supply both generate heat, and the claim is silent as to the source of the heat dissipated by the heat sink. *Id*.

2. Analysis

The phrase "[optics panel is configured to be attached to] a heat sink comprising a power supply enclosure disposed on the heat sink" appears in Asserted Claim 11 of the '410 Patent and Claim 11 of the '413 Patent. The Court finds that the phrase is used consistently in the claims and is intended to have the same general meaning in each claim. The Court further finds that the phrase does not require construction. Defendants correctly contend that the '410 and '413 Patents identify heat dissipation as a problem with prior art LEDs in an exterior lighting environment. Dkt. No. 98 at 25 (citing '410 Patent at 2:65–67). The specification also discloses attaching the LEDs to a back panel to support the LEDS and optic panel, as well as to dissipate heat produced by the LEDs. '410 Patent at 3:18–21, 3:64–4:3. The specification further states "that separating the power supply from the back panel 602 may aid in heat dissipation by the back panel 602 as it does not have to dissipate heat from the power supply to the same extent as if the power supply was mounted directly to the back panel 602." *Id*. at 7:12–16.

Defendants contend that "[a] POSITA would unmistakably understand that the heat sink of Figure 6C is dissipating heat from the LEDs of the optics panel to which it is attached. Likewise,

a POSITA would understand that the power supply enclosure is disposed on the heat sink of Figure 6C, as claimed and as Dr. Coleman agrees." Dkt. No. 98 at 25. The Court does not disagree with Defendants' argument because this is the plain language of the claims.

However, Defendants go too far by arguing that this straight forward claim language must be redrafted because there is an *O2 Micro* dispute based on Plaintiff's infringement theory. Dkt. No. 98 at 26. Defendants argue that Plaintiff's "application of the 'plain and ordinary meaning' of this limitation is that all of the components of a lighting assembly are 'attached' to the optics panel, even if they are not directly attached to each other, and that the heat sink need not dissipate heat from the optics panel, that includes LEDs." *Id*. Notwithstanding, the Court rejects Defendants' construction because the disputed phrase is easily understandable by a jury. Simply stated, the optical panel is configured to be attached to a heat sink, and the heat sink includes a power supply enclosure disposed on the heat sink. This is literally the claim language. Defendants take this clear and unambiguous claim language and make it confusing and disjointed.

To the extent that there is an *O2 Micro* dispute, it appears to be related to the term "heat sink." The specification states that the back panel 602 may include "multiple fins 708 that form a *heat sink to aid in the dissipation of heat* from the back panel 602." '410 Patent at 7:27–29 (emphasis added). Thus, the Court finds that the term "heat sink" should be construed to mean "structure that aids in the dissipation of heat."

Having resolved the parties' dispute, the Court finds that no further construction is necessary. *See U.S. Surgical Corp.*, 103 F.3d at 1568 ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro*, 521 F.3d at 1362 ("[D]istrict courts are not (and

should not be) required to construe every limitation present in a patent's asserted claims."). Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

3. Court's Construction

For the reasons set forth above, the Court finds the term "[optics panel is configured to be attached to] a heat sink comprising a power supply enclosure disposed on the heat sink" has its plain and ordinary meaning but:

- "heat sink" means "structure that aids in the dissipation of heat."

H. Preambles

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"An optics panel for use in a light emitting diode (LED) lighting assembly comprising" • '410 Patent Claims 1, 15, 21 • '413 Patent Claim 16	preamble not limiting plain and ordinary meaning	Preamble Limiting

"An optics panel for use in a light emitting diode (LED) lighting assembly for illuminating a billboard that has a display surface extending between outer edges of the billboard, the optics panel comprising" • '410 Patent Claim 10 • '413 Patent Claims 1, 5, 11	preamble not limiting plain and ordinary meaning	Preamble Limiting

1. The Parties' Positions

The parties dispute whether the preambles of Claims 1, 10, 15, and 21 of the '410 Patent; and the preambles of Claims of 1, 5, 11, and 16 of the '413 Patent are limiting. Plaintiff argues that the preambles are not limiting because the claims recite a structurally complete invention without the need for the preamble. Dkt. No. 96 at 31. Plaintiff contends that the first of the disputed preambles simply recites an "optics panel for use in a light emitting diode (LED) lighting assembly." *Id*. Plaintiff argues that the LEDs and optical elements are what is claimed, and the preamble provides no antecedent basis for the claimed invention. *Id*.

Plaintiff next states that the second preamble recites "[a]n optics panel for use in a light emitting diode (LED) lighting assembly for illuminating a billboard that has a display surface extending between outer edges of the billboard, the optics panel comprising . . . ." *Id.* (citing '410 Patent at 9:5–9). Plaintiff contends that the "optics panel" is defined as a structurally complete invention in the body of each claim. *Id*. Plaintiff also argues that the preamble includes the statement of intended use "for illuminating a billboard . . . ," and that the claims themselves are not limited to use on a billboard. *Id*. Plaintiff further contends that Defendants want to create a limiting preamble because it would limit the claims to billboard lights only. *Id*. at 31. According to Plaintiff, the display surface is not itself part of the claimed invention. *Id*. at 32. Plaintiff argues that the claims themselves define structurally complete inventions and do not provide antecedent basis for the claimed invention. *Id*.

Defendants respond that the preambles are limiting because the claim bodies depend on them for antecedence. Dkt. No. 98 at 26. Defendants contend that Plaintiff incorrectly argues that the "lighting assembly," "billboard" and "display surface" are not part of the "claimed invention" in the patents because they are just structures with which the claimed invention are used. *Id*. at 27. Defendants argue that Plaintiff's position is inconsistent with the law, and is contradicted by positions it took during prosecution. *Id*. at 27 (citing Dkt. No. 98-12 at 4-5). Defendants also argue that "billboard" is an essential structure to the claim. *Id*. at 28.

Defendants further contend that the specification is replete with references to billboards, LEDs, and lighting assemblies. *Id*. (citing '410 Patent at Abstract, 6:12–15, 5:60–64; '413 Patent at 6:19–22, 5:67–6:4). According to Defendants, the billboards, LEDs, and lighting assemblies are essential structures of the claimed invention. *Id*. Defendants argue that the preambles are therefore limiting based on recitation of "lighting assembly", "LED", "billboard" and "display surface." *Id*. at 29. Finally, Defendants contend that the preambles set forth important, fundamental, and defining characteristics of the claimed invention and are limiting. *Id*.

Plaintiff replies that the claims are not limited to billboards because the claims define a "structurally complete" invention. Dkt. No. 99 at 10. Plaintiff contends that the antecedent bases that the preambles purportedly provide are not part of the claimed invention, but instead are statements of intended use. *Id*.

2. Analysis

The phrase "[a]n optics panel for use in a light emitting diode (LED) lighting assembly comprising" is the preamble for Claims 1, 15, and 21 of the '410 Patent, and Claim 16 of the '413 Patent. The phrase "[a]n optics panel for use in a light emitting diode (LED) lighting assembly for illuminating a billboard that has a display surface extending between outer edges of the billboard,

the optics panel comprising" is the preamble for Claim 10 of the '410 Patent; and Claims 1, 5, and 11 of the '413 Patent.

"Whether to treat a preamble as a claim limitation is determined on the facts of each case in light of the claim as a whole and the invention described in the patent." *Storage Tech. Corp. v. Cisco Sys., Inc.*, 329 F.3d 823, 831 (Fed. Cir. 2003) (citation omitted). "Generally, the preamble does not limit the claims." *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002) (citation omitted). Nonetheless, the preamble may be construed as limiting if it provides antecedent basis for later claim elements. *See Seachange Int'l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1375–76 (Fed. Cir. 2005).

Here, the preambles provide antecedent basis for (i) "the lighting assembly" in the bodies of Claims 1, 6, 15 and 21 of the '410 Patent; and (ii) "the billboard" and "the display surface" in the bodies of Claim 10 of the '410 Patent and Claims 1, 5 and 11 of the '413 Patent. *Micron Tech., Inc. v. Tessera, Inc.*, 440 F. Supp. 2d 591, 597 (E.D. Tex. 2006) ("When limitations in the body of a patent claim rely upon, and derive antecedent basis from, the claim preamble, the preamble may act as a necessary component of the claimed invention.") (citation omitted).

The preambles are also limiting because they are "necessary to give life, meaning, and vitality" to the claim. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999) (citations omitted). The specification includes constant references to billboards, LEDs, and lighting assemblies. For example, the Abstract of both the '410 and '413 Patents provide "[a] substantially transparent substrate is disposed over the plurality of LEDs and configured to direct light from each of the plurality of LEDs of the lighting assembly onto a surface having a predetermined bounded area." '410 Patent at Abstract. Both patents state that "some embodiments may direct substantially all illumination from a lighting assembly 110 evenly across the surface

102 while some illumination is not evenly distributed." '410 Patent at 6:12–15; '413 Patent at 6:19–22. The "lighting assembly" gives life and meaning to the claimed invention because it is through the "lighting assembly" that the light from the LEDs is directed to a display surface.

Similarly, both the '410 and '413 Patents state that "the entire surface 102 of the billboard 100 may be illuminated even when an entire lighting assembly 110 has malfunctioned . . . due to the redundancy provided by configuration of the lighting assemblies 110." '410 Patent at 5:60–64; '413 Patent at 5:67–6:4. Thus, the "billboard" also gives life and meaning to the claimed invention because it is the billboard that the light from the lighting assembly is directed to. Accordingly, the preambles are limiting based on recitation of "lighting assembly", "LED", "billboard," and "display surface."

3. Court's Construction

For the reasons set forth above, the preambles of Claims 1, 10, 15, and 21 of the '410 Patent are limiting; and the preambles of Claims of 1, 5, 11, and 16 of the '413 Patent are limiting.

I. "display surface"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"display surface" • '410 Patent Claims 1, 7, 10, 12, 14, 15, 19, 20, 21, 25, 26 • '413 Patent Claims 1, 2, 4, 5, 6, 10, 11, 12, 16, 17	plain and ordinary meaning	"sign surface"

1. The Parties' Positions

The parties dispute whether the scope of the term "display surface" should be limited to billboards and signs, as Defendants propose, or if the scope of the terms can include any surface, such as street and sidewalk surfaces, as Plaintiff proposes. Plaintiff contends that the plain meaning of the term "display surface" is a surface that is to be displayed, and to narrow the claims beyond

that is error. Dkt. No. 96 at 33. Plaintiff further argues that even if the specification only discloses a single embodiment, the features and functions of that embodiment should not be read into the claims. *Id*.

Defendants respond that the specification repeatedly and consistently identifies the "surface" to be illuminated as the surface of a billboard. Dkt. No. 98 at 29 (citing '410 Patent at 2:11–12, 2:25–26, 2:35, 3:17–18, 4:20, 5:6). Defendants argue that the patents never refer to illuminating a "surface" other than illuminating a sign (*e.g.*, billboard) surface. *Id*. at 30. Defendants also argue that where the patent does not mention billboards, it makes clear that the invention is intended for externally illuminated signage. *Id*. (citing '410 Patent at 2:6–9, 6:47–52).

Defendants also contend that Plaintiff's position contradicts the position it took in the *Lamar* case. *Id*. at 31 (citing Dkt. No. 98-9 at 44–45). Defendants further argue that the claims' reference to both a billboard and a display surface does not weigh against construing "display surface" to mean a sign surface. *Id*. According to Defendants, the Asserted Patents unmistakably describe each embodiment in terms of billboards and signs. *Id*.

Plaintiff replies this term does not require construction as the jury will readily be able to understand the meaning of a display surface and make findings of fact related to infringement thereof. Dkt. No. 99 at 11. Regarding its position in the *Lamar* case, Plaintiff argues that it was pointing out that in the context of that indefiniteness dispute, standards related to parking lot lights were not as probative as those related to billboard lights. *Id*. According to Plaintiff, it did not make any admission that all claims of all LED lighting patents are limited to billboard lights. *Id*. Plaintiff contends that the scope of the claims with respect to these terms was not at issue in that case. *Id*. Finally, Plaintiff argues that the patents contain references to embodiments that do not mention billboards. *Id*. at 12 (citing '410 Patent at 7:21–8:30, Figs. 7A–7B, 8A–8J).

2. Analysis

The term "display surface" appear in Asserted Claims 1, 7, 10, 12, 14, 15, 19, 20, 21, 25, and 26 of the '410 Patent; and Claims 1, 2, 4, 5, 6, 10, 11, 12, 16, and 17 of the '413 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. The Court further finds that the term "display surface" does not explicitly appear in the specification. However, a person of ordinary skill in the art would understand that this is the same as the disclosed "surface" in the specification.

The specification repeatedly and consistently identifies the "surface" to be illuminated as the surface of a billboard. *See e.g.*, '410 Patent at 2:11–12 ("[B]illboard 100 includes a surface 102 onto which a picture and/or text may be painted, mounted, or otherwise affixed"); 2:25–26 ("[B]illboard 100 to illuminate some or all of the surface 102); 2:35 ("[S]urface 102 of the billboard 100); 3:17–18 ("[S]urface 102 of the billboard 100); 4:20 ("[S]urface 102 of the billboard 100); 5:6 ("[S]urface 102 of the billboard 100). "Where, as here, a patent repeatedly and consistently characterizes a claim term in a particular way, it is proper to construe the claim term in accordance with that characterization." *Wis. Alumni Research Found. v. Apple Inc.*, 905 F.3d 1341, 1351 (Fed. Cir. 2018), *cert. denied*, 140 S. Ct. 44 (2019) (citation and internal quotation marks omitted).

To be sure, the specification never refers to illuminating a "surface" as anything other than illuminating a sign (*e.g.*, billboard) surface. The specification does include two instances where it suggest uses other than billboards. However, even in these two instances, the specification indicates that lighting may be applied to "any type of sign that is externally illuminated." '410 Patent at 2:6–9; *see also id*. at 6:47–52 ("It is understood that various standard configurations of the lighting assembly 11 may be developed for various billboard and/or other externally

illuminated *sign* so that a particular configuration may be provided based on the parameters associated with a particular billboard and/or externally illuminated *sign*.") (emphasis added).

3. Court's Construction

For the reasons set forth above, the Court construes:

- "display surface" to mean "sign surface."

J. Area Terms

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"area" • '946 Patent Claims 1, 2, 30	plain and ordinary meaning	"sign"/"rectangular sign"
"rectangular area" • '248 Patent Claim 1 • '946 Patent Claim 29	plain and ordinary meaning	"sign"/"rectangular sign"
"rectangular region" • '738 Patent Claims 19, 20	plain and ordinary meaning	"sign"/"rectangular sign"

1. The Parties' Positions

The parties dispute whether the scope of the Area Terms should be limited to billboards and signs, as Defendants propose, or if the scope of the terms can include any surface, such as street and sidewalk surfaces, as Plaintiff proposes. Plaintiff contends that the specification's statements related to billboard and/or other externally illuminated signs are statements of intended use. Dkt. No. 96 at 33 (citing '946 Patent at 8:3–8). Plaintiff argues that statements of intended use do not limit the invention in their entirety. *Id*. According to Plaintiff, many embodiments are described without reference to billboards or signs at all. *Id*. (citing at '946 Patent at 8:52–9:58; Figs. 7A–B, 8A–8J, 9).

Defendants respond that the patents do not suggest they are applicable to any "area" besides

the area of a sign. Dkt. No. 98 at 32 (citing '946 Patent at 3:22–24, 3:31–33, 3:36–37, 3:45–47, 4:32, 5:37–38, 6:26, 7:15–16, 7:20–34). Defendants argue that Plaintiff ignores the identification of problems particularly associated with billboard lighting and the disclosed solutions for resolving those billboard/signage-specific problems. *Id*. Defendants contend that the specification's reference to a "rectangular target area" refers to the "rectangular target area of the surface 102," which is the "surface 102 of the billboard 100." *Id*. (citing '946 Patent at 6:24–34). Defendants further argue that Figures 7A–B, 8A–8J, and 9 are just detailed figures of the lighting assembly used to light the billboard of Figure 1. *Id*. at 33 (citing '946 Patent at 8:52–9:58, 2:42–3:5).

Defendants contend that even if a term is to be given its plain and ordinary meaning, that plain and ordinary meaning is what would be understood by a person of ordinary skill in the art in the context of the specification and prosecution history. *Id*. According to Defendants, a person of ordinary skill in the art would understand that the claimed area in the context of the Asserted Patents is a sign to be illuminated. *Id*.

Plaintiff replies that Defendants are attempting to usurp the issue of fact finding from the jury and have the Court construe these terms to import limitations where no such constructions are warranted. Dkt. No. 99 at 12. Plaintiff argues that Defendants point to the preferred embodiment in the specification, which does not explicitly define the "area" terms as being billboards or portions of billboards. *Id*. Plaintiff contends that Defendants do not point to any prosecution history showing a disclaimer or disavowal of claim scope. *Id*.

2. Analysis

The term "area" appears in Asserted Claims 1, 2, and 30 of the '946 Patent. The term "rectangular area" appears in Asserted Claim 1 of the '248 Patent; and Claims 29 of the '946 Patent. The tem "rectangular region" appears in Asserted Claims 19 and 20 of the '738 Patent. The

Court finds that the Area Terms are used consistently in the claims and are intended to have the same general meaning in each claim. The Court further finds that the Area Terms are unambiguous, easily understandable by a jury, and should be given their plain and ordinary meaning. *Aventis Pharm., Inc. v. Amino Chems. Ltd.*, 715 F.3d 1363, 1373 (Fed. Cir. 2013) ("There is a heavy presumption that claim terms are to be given their ordinary and customary meaning.") (citations omitted).

In light of the intrinsic evidence, the term "area" and "region" are broader than the previous term "display surface." Moreover, the intrinsic evidence indicates that when the patentees intended to limit an "area" or "region" to a "display surface," they did so explicitly. For example, Claim 1 of the '738 Patent recites "a display surface having a substantially rectangular region." In contrast, Claim 19 of the '738 Patent recites "a lighting assembly configured to illuminate a substantially rectangular region." Thus, Claim 19 is not limited to a display surface or sign.

The Court is cognizant that the claim terms must not be construed in a vacuum, and instead are construed in the context provided by the specification. *Phillips*, 415 F.3d at 1313. Here, the Court finds that it would be improper to limit the broader terms "area" and "region" to the single "display surface" embodiment disclosed in the specification. *Cont'l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 797 (Fed. Cir. 2019), *cert. denied*, 140 S. Ct. 648 (2019) ("We have also 'expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment.'") (quoting *id*. at 1323). Accordingly, the Court rejects Defendants' construction limiting the Area Terms to a "sign" or a "rectangular sign."

3. Court's Construction

For the reasons set forth above, the terms "area," "rectangular area," and "rectangular region" are given their plain and ordinary meaning.

K. "predetermined bounded area"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"predetermined bounded area" • '410 Patent Claims 1, 21	plain and ordinary meaning	"a bounded region that exists independent of light from the claimed LEDs"

1. The Parties' Positions

The parties dispute whether the recited "predetermined bounded area" can be defined by the light emission pattern of the claimed optics panel, as Plaintiff proposes. Plaintiff argues that Defendants' argument that the predetermined bounded area must exist "independent" of the light from the LEDs is unclear and duplicative. Dkt. No. 96 at 34. According to Plaintiff, the boundaries do not need to exist "independent" from the light emitted by the claimed LEDs. *Id*. Plaintiff contends that the "predetermined bounded area" exists in the claims merely to define the area that is lit evenly by the claimed invention. *Id*. at 35.

Defendants respond that for the area of the display surface to be "predetermined," it must be something that pre-exists without the light. Dkt. No. 98 at 34. Defendants argue that it cannot be an area that is arbitrarily defined such that it will fit whatever illumination pattern happens to be created by a light source. *Id*. Defendants contend that if it were an arbitrarily defined area, it would not be predetermined. *Id*. Defendants also argue that Plaintiff's interpretation of the claim would create a situation where infringement would depend on environmental factors outside the scope of the claim. *Id*.

Plaintiff replies that a lighting designer has the ability to select the area that he or she wishes to be lit evenly, and to select a fixture designed to light that area appropriately. Dkt. No. 99 at 13. According to Plaintiff, the "area" does not need to have physical borders that exist independent of the emitted light. *Id*. Plaintiff further contends that the intrinsic evidence supports its position. *Id*. (citing '410 Patent at 2:23–27).

2. Analysis

The term "predetermined bounded area" appears in Asserted Claims 1 and 21 of the '410 Patent. The Court finds that the term is used consistently in the claims and is intended to have the same general meaning in each claim. Claim 1 of the '410 Patent recites that the light is directed onto a display surface, with "the display surface having a predetermined bounded area, . . . wherein the light from each of the LEDs is directed through the first lens element and the second lens element across the entire area of the display surface so that each LED evenly illuminates substantially the entire display surface with a substantially equal level of illumination from each of the LEDs." '410 Patent at Claim 1.

In order to measure the evenness of the light that strikes the entire area of the display surface, it must be determined by the dimensions of the display surface itself. In other words, "the boundaries do not need to exist 'independent' from the light emitted by the claimed LEDs," as Plaintiff contends. Dkt. No. 96 at 34. If the predetermined bounded area was determined by the illumination pattern, then the claims could have referred to a "predetermined bounded illumination pattern of light." Accordingly, the Court rejects Plaintiff's contention.

The Court generally agrees with Defendants' argument, but does not adopt Defendants' construction because it adds a number of new terms to the claims. Specifically, Defendants' construction redrafts "area" as "region," and "predetermined" as "that exists independent of light from the claimed LEDs." The Court is concerned with the unintended consequences of Defendants' redrafted claim language. Accordingly, the Court construes that term "predetermined bounded area" to mean "area determined by the dimensions of the display surface." The Court further notes that the specification contemplates that the "predetermined bounded area" may be only a portion of the billboard, rather than the entire billboard. '410 Patent at 2:23–27 ("One or

more lighting assemblies 110 may be coupled to the walkway 108 . . . to illuminate some or all of the surface 102 in low light conditions.").

3. Court's Construction

For the reasons set forth above, the Court finds:

- "predetermined bounded area" means "area determined by the dimensions of the display surface."

L. "desired uniformity ratio"

Disputed Term	Plaintiff's Proposal	Defendants' Proposal
"desired uniformity ratio" • '410 Patent Claim 4	plain and ordinary meaning	Indefinite

1. The Parties' Positions

The parties dispute whether the term "desired uniformity ratio" is indefinite. Defendants argue that the '410 Patent fails to provide any standard of measure to determine the objective boundaries for what "desired" means in the context of the claim. Dkt. No. 98 at 34-35. Defendants contend that the term "desired" appears nowhere in the specification. *Id*. Defendants further contend that Plaintiff's expert opines that what is "desired" depends on the "manufacturer's instructions, guidelines, and/or recommendations." *Id*. (citing Dkt. No. 96-9 at ¶ 84).

Defendants also argue that claim differentiation mandates that the "desired" ratio recited in Claim 4 be different, and broader, than the ideal 3:1 ratio described in the specification. *Id*. at 35–36. Defendants contend that nothing in the '410 Patent discusses or supports any other ratio or even suggests which direction the ratio should move, e.g., down to 2:1 or up to 4:1. *Id*. at 36. According to Defendants, without any standard to go by, the term "desired" is nothing more than the unbounded whim of the designer. *Id*. Defendants lastly contend that nothing about "a particular

illumination profile" offers any objective standard for a person of ordinary skill in the art to apply to determine the scope of the "desired uniformity ratio." *Id*. (citing Dkt. No. 96-10 at ¶ 79).

Plaintiff argues that Claim 4 depends from Claim 3, which states that "the illumination for each LED has a particular illumination profile." Dkt. No. 96 at 35 (citing '410 Patent at 8:53–55). Plaintiff contends that Claim 3 requires that each LED has a particular illumination profile, Claim 4 requires that the desired uniformity profile is expressed in a particular way, and Claim 5 specifies that the uniformity ratio is 3:1. *Id*. Plaintiff argues that even if Claim 4 is found to be indefinite, Claim 5's expression of the desired uniformity ratio as a numerical value would not be indefinite. Dkt. No. 99 at 13.

Plaintiff also argues that it is clear from the context of the claims that the "desired uniformity ratio" is the uniformity ratio desired by the designer of the apparatus. Dkt. No. 96 at 35 (citing Dkt. No. 96-9 at ¶ 84). Plaintiff contends that the designer would understand that manufacturers provide information on how the apparatuses should be installed, and that the ratio is that which the lighting apparatus is designed to provide when installed and used according to the manufacturer's instructions, guidelines, and/or recommendations. *Id*.

2. Analysis

The term "desired uniformity ratio" appear in Asserted Claim 4 of the '410 Patent. The term "desired" is a term of degree, and although terms of degrees are not automatically indefinite, the Court finds that the intrinsic evidence here does not provide any standard of measure to determine the objective boundaries for what the term means. First, the term "desired" does not appear in the specification. Moreover, Plaintiff's own expert opines that what is "desired" depends on the "manufacturer's instructions, guidelines, and/or recommendations." Dkt. No. 96-9 at ¶ 84. "Desired" in this context is similar to the disputed terms in *Datamize* and *Interval Licensing* that

were found to be indefinite.

In *Datamize*, the disputed term was "aesthetically pleasing," which was determined to be "a value judgment that inherently varies from person to person." *See Sonix*, 844 F.3d at 1378 (describing *Datamize*). In *Interval Licensing*, the disputed term was "in an unobtrusive manner that does not distract," which was determined to implicate "a person's individual focus, concentration, attentiveness, or similar mental state at a given moment, or even opinions, affecting what is or is not distracting." *See id*. (describing *Interval Licensing*). Here, the term "desired" depends on an individual designer's subjective decision, and thus, is indefinite.

In addition, claim differentiation points to the subjectivity of this term. Claim 5 of the '410 Patent recites that the uniformity ratio must be 3:1. This means that the "desired" ratio recited in Claim 4 must be broader than the ideal 3:1 ratio described in the specification. *See Karlin Tech., Inc. v. Surgical Dynamics, Inc.*, 177 F.3d 968, 971–72 (Fed. Cir. 1999) ("[T]he common sense notion that different words or phrases used in separate claims are presumed to indicate that the claims have different meanings and scope.") (citation omitted). However, nothing in the '410 Patent indicates whether any ratio above or below would be "desired." Without any objective boundary to go by, the term "desired" is purely subjective because it is at the whim of the designer.

Finally, the prosecution history provides no assistance for this term, and neither party cites to any portion of the prosecution record to support their positions. Accordingly, the Court finds that the term "desired uniformity ratio" is indefinite because the term, viewed in light of the specification, fails to "inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus*, 572 U.S. at 910. Finally, in reaching its conclusion, the Court has considered the extrinsic evidence submitted by the parties, and given it its proper weight in light of the intrinsic evidence.

3. Court's Construction

For the reasons set forth above, the Court finds that the term "desired uniformity ratio" is indefinite for failing to inform, with reasonable certainty, those skilled in the art about the scope of the invention.

V. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit. The parties are ordered to not refer to each other's claim construction positions in the presence of the jury. Likewise, in the presence of the jury, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court. The Court's reasoning in this order binds the testimony of any witnesses, and any reference to the claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 25th day of October, 2020.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE